

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A trans-luminal, guidewire-advanced, rapid-exchange surgical delivery device having a proximal end, a primary shaft and a distal zone to be advanced over the guidewire along a bodily lumen to a site of surgery, the device comprising:
 - i. guidewire tubular means defining a guidewire lumen, said guidewire tubular means lying within the distal zone with the guidewire lumen to one side of the primary shaft, the guidewire lumen having a length that longitudinally overlaps a length of the primary shaft and having a proximal end opening which lies to one side of the primary shaft; and
 - ii. a sleeve defining a lumen to receive a surgical element distal of the guidewire tubular means, a proximal end of the sleeve ~~form-fitted~~ over the primary shaft including a radially inwardly tapering portion proximal of the proximal end opening of the guidewire tubular means, said inwardly tapering portion defining a proximal guidewire lumen exit port, and a tubular constant diameter nose portion proximal of the radially inwardly tapering portion, the nose portion defining a proximal-most end of the sleeve.
2. (Previously presented) The delivery device according to claim 1, wherein said primary shaft is a tube.
3. (Previously presented) The delivery device according to claim 2, wherein said tube contains an inner shaft which, in use, may slide relative to the tube, whereby the imposition of endwise compression on the inner shaft and endwise tension on the tube may withdraw the sleeve proximally relative to the distal end of the inner shaft.
4. (Previously presented) The delivery device according to claim 3, wherein the distal end of the inner shaft is configured as a pusher, to maintain the position of said surgical element at said site of surgery during proximal withdrawal of the sleeve to expose the surgical element to the bodily lumen.

5. (Previously presented) The delivery device according to claim 4, including the surgical element.

6. (Previously presented) The delivery device according to claim 5, wherein the surgical element is a self-expanding stent.

7. (Previously presented) The delivery device according to claim 1, wherein the sleeve is reinforced by filamentary material within its wall thickness.

8. (Previously presented) The delivery device according to claim 7, wherein the filamentary material is braided material.

9. (Previously presented) The delivery device according to claim 7, wherein the filamentary material stops distally short of the distal end of the sleeve.

10. (Previously presented) The delivery device according to claim 1, wherein the distal end of the sleeve is tapered inwardly to provide the device, at least prior to its arrival at the site of surgery, with a more or less atraumatic tip.

11. (Currently amended) The delivery device according to claim 1, wherein the proximal end of the sleeve is form-fitted over the primary shaft by the application of heat and radially inward pressure, the proximal end of the sleeve, in profile, resembling a dolphin's head.

12. (Previously presented) The delivery device according to claim 1, wherein the sleeve includes a push zone through which an endwise compression force imposed on the proximal end of the primary shaft can be transferred to the sleeve for advancing the sleeve along the bodily lumen to the site of surgery.

13. (Previously presented) The delivery device according to claim 12, wherein the push zone corresponds to an annulus in which the sleeve has a reduced outside diameter relative to its diameter immediately proximal of said push zone.

14. (Previously presented) The delivery device according to claim 12, wherein the push zone corresponds to an annulus in which the sleeve has a reduced inside diameter relative to its inside diameter immediately proximal of said push zone.

15. (Previously presented) The delivery device according to claim 12, wherein the push zone is found immediately distal of the distal end of the primary shaft.

16. (Previously presented) The delivery device according to claim 1, wherein the guidewire tubular means includes a guider tube and wherein the guider tube extends distally beyond the distal end of the primary shaft.

17. (Previously presented) The delivery device according to claim 16, and including a guidewire guider hose having a proximal end and a distal end, said proximal end being contiguous with the distal end of the guider tube.

18. (Previously presented) The delivery device according to claim 17, wherein the distal end of the guider hose is flared radially outwardly, towards the luminal wall of the sleeve.

19. (Previously presented) The delivery device according to claim 18, wherein the inner shaft extends distally beyond the distal end of the guider hose, along a path between the abluminal wall of the guider hose and the luminal wall of the sleeve.

20. (Previously presented) The delivery device according to claim 19, wherein the distal end of the inner shaft carries an annular surgical element pusher which defines a portion of the length of the guidewire lumen which is aligned with the lumen for the guidewire beyond the distal end of the guider hose.

21. (Previously presented) The delivery device according to claim 20, wherein the annular pusher carries a carrier tube which extends distally from the annular pusher and itself defines a portion of the length of the guidewire lumen.

22. (Previously presented) The delivery device according to claim 21, wherein the carrier tube carries a radiopaque marker band at or near its distal end.

23. (Previously presented) The delivery device according to claim 21, wherein the carrier tube extends proximally from the annular pusher sufficiently far to define a portion which tapers outwardly towards the luminal wall of the sleeve, for guiding into the carrier tube the distal end of a guidewire advanced through the guidewire lumen distally, from the proximal guidewire lumen exit port.

24. (Previously presented) The delivery device according to 19, wherein the inner shaft includes a connector, located axially between the distal end of the primary shaft and the annular pusher, said connector permitting adjustment of the axial position of the annular pusher relative to the distal end of the sleeve, during assembly of the device, to cater for different lengths of the surgical element.

25. (Previously presented) The delivery device according to claim 24, wherein the inner shaft comprises a distal portion of solid cross-section and a proximal tube portion, the proximal tube portion extending within the primary tube shaft and distally therefrom, to said connector, or to a point proximal of said connector.

26. (Previously presented) The delivery device according to claim 25, wherein the inner shaft exhibits an unbroken metal strand as far as the annular pusher.

27. (Withdrawn) The delivery device according to claim 1, in which the sleeve can be withdrawn proximally to release a self-expanding implant and which includes a stopper to prevent proximal movement of the implant when the sleeve moves proximally, and wherein the primary shaft exhibits a pull wire for pulling back the sleeve and a shaft tube with a lumen containing the pull wire and with a distal end operatively connected to the stopper.

28. (Withdrawn) The delivery device according to claim 27, wherein the shaft tube is a stainless steel or cobalt alloy hypo tube.

29. (Withdrawn) The delivery device according to claim 27, wherein the pull wire is of metal.

30. (Withdrawn) The delivery device according to claim 27, wherein the sleeve is of polymer with fiber reinforcement within the polymer wall thickness.

31. (Withdrawn) The delivery device according to claim 30, wherein said reinforcement fibers are braided metal strands.

32. (Withdrawn) The delivery device according to claim 27, wherein the pull wire is connected to the sleeve by first and second coaxial metal rings, one radially inside the sleeve and the other radially outside the sleeve.

33. (Withdrawn) The delivery device according to claim 32, wherein the metal ring outside the sleeve is swaged down onto the sleeve.

34. (Withdrawn) The delivery device according to claim 27, wherein the sleeve has an inwardly tapered distal tip.

35. (Withdrawn) The delivery device according to claim 27, and including a collar having a peripheral surface and first and second lumen, wherein i) the shaft tube is slidably received in the first lumen; ii) the second lumen is said guidewire lumen; and iii) the peripheral surface carries the proximal end of the sheath with the collar sliding proximally along the shaft tube during proximal withdrawal of the sleeve.

36. (Withdrawn) The delivery device according to claim 27, and including a pusher tube which defines a lumen through which a guidewire may be advanced, which carries said stopper, and which is bonded at its proximal end to one side of the distal end of the shaft tube.

37. (Withdrawn) The delivery device according to claim 36, further including a pusher tube extension which continues the lumen of the pusher tube, distal of the stopper, distally to the region of the distal tip of the sleeve.

38. (Withdrawn) The delivery device according to claim 37, wherein the pusher tube extension carries a distal radiopaque marker band.

39. (Withdrawn) The delivery device according to claim 16, wherein the guider tube is a shaped element of polymer.

40. (Withdrawn) The delivery device according to claim 16, wherein the guider tube is a shaped element that includes a lumen to receive the distal end of the primary shaft.

41. (Withdrawn) The delivery device according to claim 40, wherein the primary shaft is fixed in the receiving lumen of the guider tube against relative axial movement.

42. (Withdrawn) The delivery device according to claim 41, wherein the guider tube is of metal and has a protuberance over which the sleeve is form-fitted.

43. (Withdrawn) The delivery device according to claim 41, in which the guider tube is of polymer, and the sleeve is fused to the guider tube.

44. (Previously presented) The delivery device according to claim 1, wherein a proximal portion of the guidewire tubular means is welded to a distal portion of the primary shaft.